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TRANSPORTATION IN MARKETING MOLASSES FOR FEED

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U. S. DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Marketing Research Division

Marketing Research Report No. 149 January 1957

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SUMMARY AND CONCLUSIONS

The use of molasses in livestock feed has grown considerably in recent years and this has brought changes in methods of transporting molasses. The use of tank trucks in conjunction with railroad and waterborne carriers, particularly as the last step in the transport route to the consumer, has gained importance. Also, tank trucks are being used increasingly to move molasses from seaport terminals directly to users. Railroads have held their own in volume of molasses handled, but have not shared proportionately in the longer hauls to more distant inland markets, or in the total increase in molasses movement. Railroads have reduced their rates for molasses to some important consumer points in recent months. The effects of these reductions are as yet undeterminable from published statistics.

Waterborne carriers of bulk molasses on inland waters, particularly the Mississippi River system, increased their volume of molasses transported manyfold between 1949 and 1954. In 1949 they carried only 4,147 tons, all to a single upriver port. In 1954, their volume was 339,494 tons upriver, and 2,845 tons downbound. Their operation combines the low cost of water movement for large volumes of bulk materials with the use of tank trucks from upriver terminals for the shorter hauls to the customers' receiving points.

The costs of transporting molasses are such that tank trucks can readily compete with railroads at distances under 250 miles from terminal to consumer. The services which can be provided with tank-truck delivery are particularly important to livestock feeders with less than 100 head of livestock and to mixed-feed mills producing less than 2,500 tons of feed per year. It appears that railroads will continue to be the important carrier for distant points away from navigable water and also will compete for large volume shipments in the areas adjacent to navigable water; costs are the same to the consumer as for other shipping methods.

Bulk delivery and the consequent saving in cost are not available to all livestock feeding areas. Two general problems of the industry are methods of servicing scattered users and user dissatisfaction with present methods for quality and quantity determination. Return loads to reduce truck "deadhead returns" and lack of standardized highway weight regulations are problems for the tank-truck carriers. Railroad problems would be relieved if the roads could find ways to improve consumer services, particularly by reducing the minimum size of bulk purchase required and by improving the scheduling of deliveries.

Many of the problems related to movement of molasses to livestock feeding areas were solved between 1949 and 1954. There still remains the task of bringing these improvements to all areas and coordinating the efficiencies achieved by each method into a unified but competitive system to provide maximum benefits to all segments of the molasses industry.

TRANSPORTATION IN MARKETING MOLASSES FOR FEED

By

Frederick J. Poats, agricultural economist[1]

Marketing Research Division
Agricultural Marketing Service

BACKGROUND

Transportation costs are the largest item of marketing costs for molasses and the major factor affecting the price to consumers and the returns to producers. Previous studies of molasses marketing problems have shown that the ratio of transportation and marketing costs to the consumer's purchase price is very high. A study made in 1949[2] revealed that of a delivered price of 26.7 cents per gallon for cane blackstrap molasses in Wisconsin, marketing charges, including transportation, handling, and brokerage, amounted to 24.2 cents. Most of this 24.2-cent cost was for transportation and handling charges between the sugar mill in Puerto Rico and the farm in Wisconsin.

The ability of producers to dispose of molasses in distant markets in competition with other feedstuffs depends largely upon the costs and efficiency of transportation and marketing.

This report is devoted to the transportation of molasses from the producer to the user, with particular attention to the methods, practices, and costs of the three types of bulk transport--trucks, railroads, and waterborne carriers--between seaport terminal or mainland producer and consumer.

During the period covered by the study (1949-54), a shift in the major market outlet for molasses occurred. The primary market outlet at the beginning of the period was the fermentation alcohol industry. In 1950, synthetic alcohol made from the petroleum products ethylene gas and ethyl sulfate became prominent as a competitor for the fermentation alcohol market, and in succeeding years synthetic alcohol has taken over a major part of the total industrial alcohol market.

Movement of molasses to the fermentation alcohol industry was characterized by large-unit shipments to a relatively few alcohol-making plants, most of which were located at or near deep water ports or in major railroad centers. The change to the livestock feeding industry as the major outlet for molasses also changed the transportation and distribution problems. Feed-mixing plants and individual farm users of molasses are scattered throughout the United States and are away from the port terminals and other sources of molasses. Also, the unit of purchase in the livestock feeding industry, except for a few major feed-mixing firms, is much smaller than former shipments to the fermentation alcohol industry. These conditions make transportation costs a larger factor in molasses marketing when it is sold to the livestock feeding industry.

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[1] Credit is due to Albert B. Davis, agricultural economist, AMS, for preliminary analysis of many phases of the report concerning the operations of tank trucks and of waterborne carriers.

[2] Kutish, L. John. The Marketing of Feed Molasses. Prod. and Mktg. Admin., U. S. Dept. Agr., 32 pp., illus. February 1950.

The information and statistics given in this report for the three major types of transportation for molasses show the impact of molasses use in livestock feeding on the molasses distributing industry. The change has brought new firms into the industry, particularly tank-truck operators, and has altered the organization and selling operations of existing firms.

In some respects, the molasses distributor, or the primary distributor as he is called in the trade, is unique among suppliers to the livestock feed trade. He owns the molasses, the storage facilities, and a considerable portion of the distribution equipment, such as tank cars, tank trucks, and barges, and, in a few instances, even the storage and dispensing equipment used by the livestock feeder.

The major portion of the molasses used for livestock feed is produced in offshore domestic and foreign sugarcane growing areas during the late winter to early summer months when feed requirements are lowest. Storage facilities in many of these areas are inadequate to hold the molasses produced. At this time, the primary distributor buys the molasses, ships it, and stores it in tanks at a major seaport terminal until it is sold.

As produced, much of the offshore molasses is of very high density (84 to 94 degrees Brix) and requires dilution and mixing before resale for feed use. Molasses trade sources indicate that the average gain in volume by mixing equals 10 percent.

The sugar content of molasses is a primary factor in determining the producer's price but is not a pricing factor in sales to feeders. Molasses is sold to the feed trade on the basis of Brix (generally 79.5 degrees) and also in some areas on the basis of total digestible nutrients.

When the fermentation alcohol industry was the major outlet for molasses, the primary distributor's function involved a considerable gamble. Molasses was bought several months ahead of the marketing period, and buyers gambled on the future supply and demand conditions in the industrial alcohol market. The time period between buying and selling for livestock feed use is not very different from that experienced formerly, but the market conditions are more stable, the requirements and demand conditions can be forecast more accurately, and the elasticity of demand is much greater than for alcohol making.

These factors have led to better economic health for the entire molasses industry. Sugar mills have begun to bargain for better prices for molasses instead of hurrying to rid themselves of what was a burdensome waste product. Primary distributors have sought larger shares of the available supply. Feed mixers have found molasses-containing feeds to have a greater buyer appeal than feeds without molasses and have formulated new feeds, some of which contain large percentages of molasses, to answer this demand.

Information presented in this report on marketing of molasses by tank truck is based on personal interviews with all the known firms operating two or more trucks. Operational data were not obtained from the three multiple branch firms in the industry since they were reluctant to release confidential data. Therefore, references to costs of operating tank trucks are based on information from the smaller independent tank truck operators. Data on railroad and waterborne movement of molasses are derived from published sources.

MARKETING MOLASSES BY TANK TRUCK

The Molasses Trucking Industry.--Tank-truck distribution of molasses has expanded rapidly in the last few years and is now considered by prominent trade sources to be the principal method of delivery for livestock feed purposes.

The industry is composed of 3 large firms and about 50 small firms. Each of the large firms has several seaport terminal facilities, large fleets of tank trucks, and redistribution terminals at inland points. Each of the small firms operates in only one area and has one or more tank trucks. These small firms buy their molasses either from one of the large firms or from other primary distributors who do not maintain their own trucking facilities. Nearly all inland molasses redistribution terminals are subsidiary establishments of the primary distributors with major seaport facilities and their own facilities for transport to these inland points; thus the distributors operate an integrated marketing system for their molasses.

Competition is reported to be very keen, both among the large firms, particularly for sales territories, and between the small firms and the large firms. Most of the small firms compete for sales on the basis of customer adherence to them, by special services, or by lower prices through lower overhead costs or lower net operating returns.

In most instances, the price paid for molasses by the small tank-truck operator is the same as that paid by individual consumers who buy directly from the primary distributors. In these cases, the small firm is able to compete only by offering delivery services at a cost equal to or cheaper than those of his supplier, or by offering some extra service, such as delivery of loads of less than 3,000 gallons, part-load delivery, or servicing of individual molasses feeding tanks.

Most of the equipment used by tank-truck distributors of molasses is of the tractor and semitrailer type. Some truckers also have tank trucks of less than 2,000-gallon capacity. The tank trailers are designed for transporting heavy liquids (molasses weighs approximately twice as much as gasoline per unit of volume) with tank capacities up to 3,500 gallons. Tank-truck operators reported that typical loads ranged from 5 tons to 22 tons. The average load reported was 16.4 tons, with a 17-ton load most frequently reported. The frequency of this 17-ton unit was due to State highway weight restrictions rather than the top capacity of trailer tanks. Most of the tank trailers are equipped with a motor-driven pump for delivery of the molasses to elevated tanks as well as for more rapid unloading to gravity flow levels.

The development and use of equipment to haul return loads is increasing. One type has a low-slung flat-topped tank for molasses and a flat, low-sided bed for grain or other bulk materials on top of the tank. Another variation has a stake body above the tank for hauling livestock on the return trip.

Most tank-truck operators own the molasses that they distribute. A few are strictly contract haulers for one or more of the molasses distributors and do a freighting business as a service to the molasses seller or buyer.

Areas Served and Types of Service by Tank-truck Facilities.--The map, figure 1, shows the location of all the known[3] molasses distribution operations by tank truck in the United States. As can be seen, tank-truck facilities are available to a large part of the major livestock feeding areas. Topography, low density of livestock numbers, and inability of distributors to sell molasses in competition with other feeds are the principal reasons given for the "open" areas on the map. The Southwest has the greatest concentration of molasses trucking operators. This area also probably has the greatest concentration of farm users of molasses.

Tank truckers said distance of customer from their terminals and competition with molasses haulers from other terminals were the principal factors limiting the territory covered. Some operators reported a prohibitive increase in cost when the round trip time exceeded 1 day. Table 1 shows the average and range of maximum distances hauled by individual tank truckers as reported in each of the four regions of the United States.

[3] As of February 1955, when survey was completed.

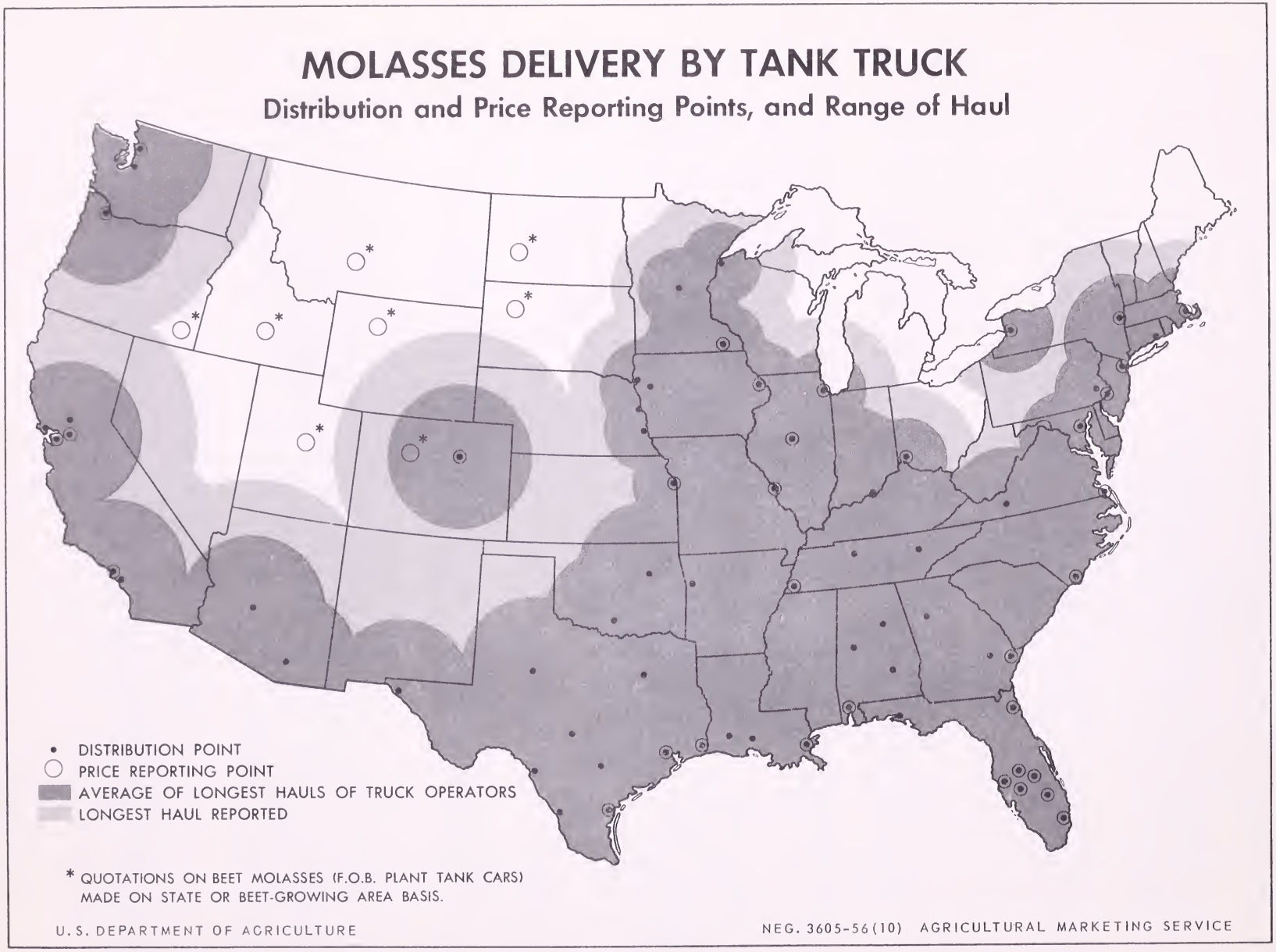
MOLASSES DELIVERY BY TANK TRUCK
Distribution and Price Reporting Points, and Range of Haul
DISTRIBUTION POINT
PRICE REPORTING POINT
AVERAGE OF LONGEST HAULS OF TRUCK OPERATORS
LONGEST HAUL REPORTED
* QUOTATIONS ON BEET MOLASSES (F.O.B. PLANT TANK CARS) MADE ON STATE OR BEET-GROWING AREA BASIS.
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Figure 1

Table 1.--Average and range of distances to their most distant customers reported by individual tank truckers

Region	Average	Range
	Miles	*Miles*
Northeast and Middle Atlantic	135	75-250
South Atlantic and Gulf Coast	200	20-375
Central	124	40-250
Southwestern, Rocky Mountain, and Pacific Coast	243	60-450

Feed mills and feed-mixing firms are the principal customers for molasses shipped by tank truck. In this market the tank trucker competes with the railroads, since many of the feed mills also have railroad sidings adjacent to their mills. Some of the reasons reported by mill managers for preferring tank-truck deliveries of molasses were: Lack of sufficient storage for a carload of molasses; quick service by truck operators; and when freighting charges were equal, the lower cost of unloading, since the truck operator furnished this as a part of his delivery service.

Farmers, ranchers, and feed-lot operators made up the second largest molasses outlet served by truckers. This market has been developed largely through the efforts of tank-truck distributors, and is, except for some large feed lots, dependent upon the tank truck as a mode of supply.

Servicing of retail outlets for molasses--feed stores, small mills, and country general stores--is another operation carried out by tank truckers. In instances reported, this operation is not large, the usual practice being to fill one or more drums. The tank-truck distributor can service these customers at a lower cost than was possible when the retailer bought molasses already in drums. Two such retailers reported that the shift in method of receipt allowed a reduction in the retail price to less than half that formerly charged.

Cost for Tank Truck Operation.--The average cost of operating a tank truck for a "round-trip mile" was variously reported as being from 15 cents to 42 cents. The average of operators' costs reported was 23.6 cents per round-trip mile. The method of computation used measures only the operational costs of moving the molasses and returning the truck. Each estimate of cost of an individual operator was based on a typical load, and in several instances the cost figure given was the same as used for computing the charge for delivering molasses to a new customer when no other basis than mileage was available.

On a per-gallon per-mile basis, the computed average charge for tank-truck delivery of molasses varied from 1/10 to 15/100 of a mill for individual truck operators. The average of all reports was very close to 1/10 of a mill per gallon per round-trip mile.

Newly established operators were found to have given very little attention to their overall costs; they were either following the charges made by other operators selling in the same territory or, if selling in a new territory, were charging what the customers would pay to get molasses.

Tank-truck operators located at points up to 450 miles from the wholesale terminal point preferred to truck their own supplies of molasses, rather than have rail deliveries. Several reasons relating to differences in costs were given for this practice: (1) By getting molasses at the terminal in his truck, the operator frequently could deliver it directly to the customer without rehandling it into and out of his own storage;

(2) at slack times the overhead costs of the tank truck and driver continue even if equipment is idle, and the costs for hauling molasses with his trucks over the longer distance are less than the railroad freight charges plus the continuing overhead on idle tank-truck equipment, and (3) truck pickup from the terminal is more flexible and gives a quicker turnover, both in handling and in financing, than tank-car deliveries.

One-third of the operators of tank trucks were located in towns or cities away from the terminal city. Sixty-four percent of tank-truck operators had their own storage facilities. Nearly all of those located away from the terminal city had their own storage facilities.

Factors Affecting the Competitive Position of Molasses Handled by Tank Truck. -- There were five main points or issues brought out by interviews with tank-truck distributors which affect their competitive position:

(1) Continuing favorable price ratios between molasses and its grain equivalents.

(2) Education of livestock raisers on usage of molasses for livestock feeding.

(3) Expansion of waterborne traffic in molasses into livestock feeding areas. The development of the St. Lawrence Seaway and the Mississippi tributary system was particularly cited. Waterborne carrier operation to inland terminals plus tank-truck operations to service customers can compete with and expand present molasses use beyond volume of sales attained by rail tank-car deliveries in these areas.

(4) Opportunities for return loads. Equipment development and regular runs between specific points where loads are available for 2-way hauling are required before this can be fully achieved.

(5) Standardization of highway load regulations between States and between first, second, and third class roads within States.

A sixth factor derived from interviews with farm receivers and tank-truck operators considered the customer service aspect of present molasses deliveries and ways to improve it. Four suggestions were made: (1) Put equipment on tank trucks which will meter molasses by weight at the time of delivery; (2) sell molasses on the basis of its sugar content instead of the present degrees Brix and total weight or gallonage; (3) use sealed tanks or compartments on tank trucks, to be sealed by the primary distributor at the inland terminal. These seals, when unbroken, would guarantee the quantity and quality of molasses as certified by the wholesale distributor[4]; (4) use separate compartment loads, dividing the total tank capacity of the truck into units of 300 to 500 gallons to serve smaller unit customers. Each customer could purchase the contents of one or more compartments, according to his needs and storage capacity.

This last recommendation has merit on several points: It would allow small-unit customers to have bulk deliveries and lower purchase prices, and larger users could buy more frequently and govern their purchases according to their needs and to fluctuations in the market price for molasses. Users having requirements equal to 1 or 2 tank-truck loads a season frequently have found their supply exhausted a few weeks too early in the spring, or they have had some molasses left over. Inflexibility of storage and delivery volume and price movements of molasses during the feeding season can put the infrequent purchaser of molasses at a disadvantage relative to the larger user in the same situation.

[4] This point was suggested as a means for clearing up a situation that sometimes developed. A user's complaint on quality or quantity of molasses delivered bounced between the tank-truck operator and his supplier, with the resultant dissatisfaction of unassignable responsibility.

MARKETING MOLASSES BY RAILROAD TANK CAR

Railroads have served for many years as large-volume carriers of molasses. Before 1948, they were almost exclusive transporters of molasses to inland consumer markets. Increased use of molasses for livestock feed after World War II caused a shift in the railroads' position of dominance. Market conditions in the livestock feeding industry were the primary factors which brought about a shift from the movement of molasses almost entirely by rail to the movement of large volumes by tank truck and waterborne carriers.

Railroads carry molasses in tank cars or in drums. To buy in bulk, a livestock feeder or feed mill has to have a rail siding and facilities for storage of at least 8,000 gallons.[5] Drum-lot transportation, handling, and selling charges on molasses are prohibitive except for special purposes such as a silage preservative or for livestock medicinal purposes. In two instances on the Atlantic seaboard where method of distribution changed from drum handling by rail to tank truck, with drums filled at the country point, prices to the farm user were reduced from 56 and 75 cents per gallon to 17 and 21 cents, respectively. During the period of this change the primary distributor's price at the port terminal remained unchanged.

The annual volume of molasses hauled by railroads in each of the railroad regions is shown in figure 2.

In the transportation of molasses in 1954 the railroads were competitors of the barge lines and the "long haul" truck operations that served large-volume consumers. The volume of molasses hauled by railroads did not change greatly from 1949 through 1954, but the railroads' share of the total molasses traffic decreased by 20 percent. Table 2 shows the relationship between molasses utilization and the total tonnage transported by railroads.

Table 2.--Molasses utilized for all purposes and volume moved by railroads, 1949-54

Year	Utilized for all purposes[1]	Volume moved by railroads[2]	Railroad movement as a proportion of total utilized
	Tons	*Tons*	*Percent*
1949	2,541,000	1,294,079	51
1950	2,656,100	1,321,195	50
1951	2,740,300	1,198,786	44
1952	3,097,100	1,380,529	45
1953	3,656,700	1,478,326	40
1954	3,198,000	1,354,087	42

[1] AMS, Grain Division.
[2] Tons of tank car lot terminations, class 1 U. S. steam railroads.

Statistics for class 1 steam railroads, Interstate Commerce Commission.

The available statistics do not lend themselves to direct measurement of the changes in volumes moved to inland points and to a determination of the increase in ton-miles required of transporting firms for molasses to reach a market. The increase in ton-miles is conservatively estimated to be 20 percent during the period 1949 through 1954.

[5] At a rate of use equal to 4 pounds per day per 1,000 pounds of body weight, this would feed 1,000 cattle of feeder lot average weights 25 to 30 days. For a small livestock farm with 50 head of cattle the tank-car load would last at least 360 days. This volume of delivery is too large and not economically feasible for this size of livestock operation, and to reach the market represented by this group, as well as to reach the market away from rail facilities, the tank-truck operation came into a position of importance in the marketing system.

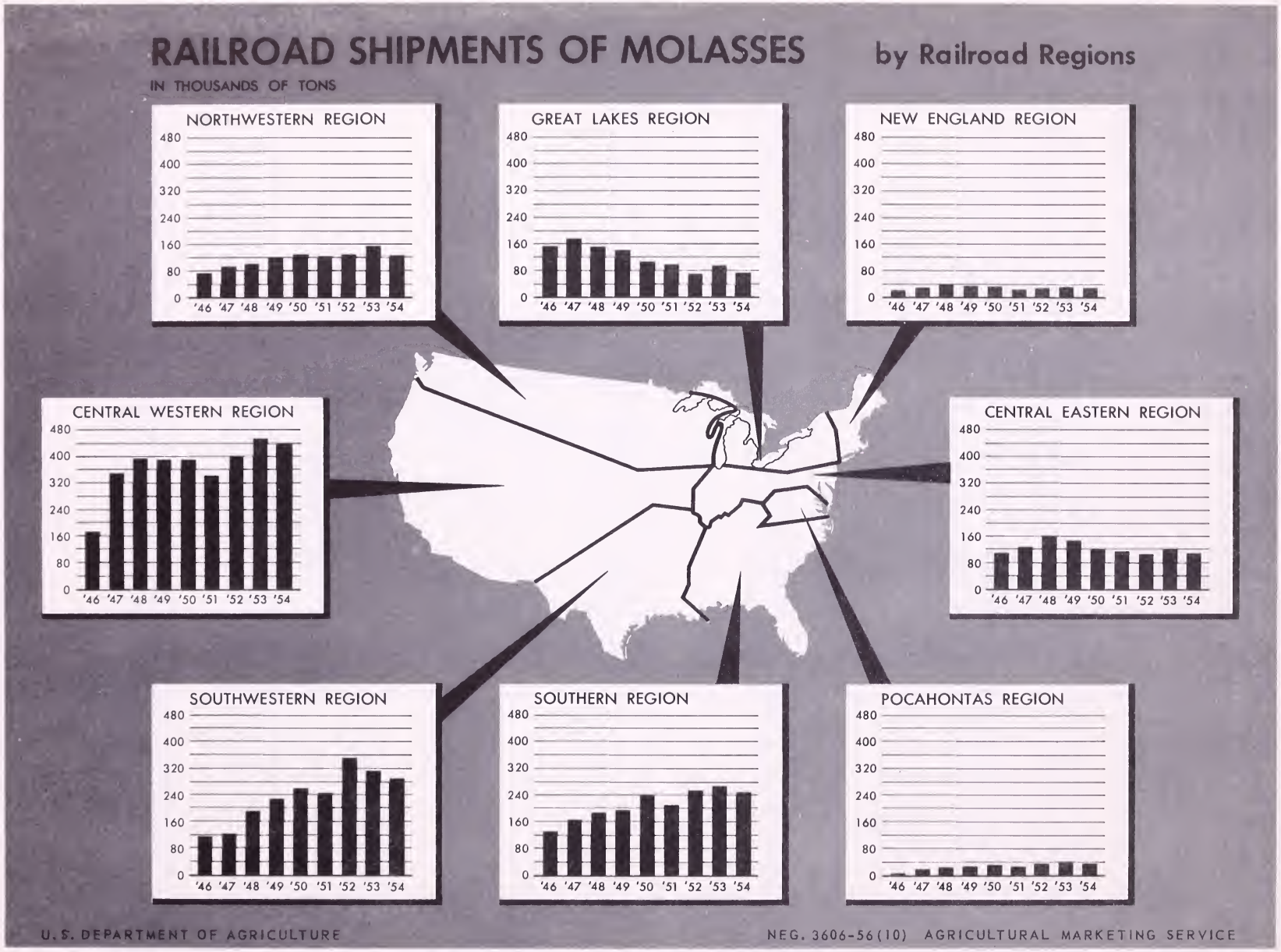
RAILROAD SHIPMENTS OF MOLASSES
by Railroad Regions
IN THOUSANDS OF TONS
NORTHWESTERN REGION
GREAT LAKES REGION
NEW ENGLAND REGION
CENTRAL WESTERN REGION
CENTRAL EASTERN REGION
SOUTHWESTERN REGION
SOUTHERN REGION
POCAHONTAS REGION
480
400
320
240
160
80
0
'46 '47 '48 '49 '50 '51 '52 '53 '54
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Figure 2

The computation of total revenues for rail movements of molasses shown in table 3 and of the average revenue per ton of all molasses utilized indicates that railroad revenues from moving molasses have not increased substantially with the increase in volume utilized and the increase in ton-miles required for moving molasses to interior livestock feeding areas.

Table 3.--Molasses movement and revenue for class 1 steam railroads, 1949-54

Year	Volume moved[1]	Revenue	Average revenue per ton moved
	Tons	*Dollars*	*Dollars*
1949	1,294,079	9,289,286	7.18
1950	1,321,195	9,897,611	7.49
1951	1,198,786	9,689,898	8.08
1952	1,380,529	11,835,443	[2] 8.57
1953	1,478,326	12,870,411	[2] 8.70
1954	1,354,087	11,584,054	[2] 8.55

[1] Total tonnage of terminations.
[2] Includes 15-percent freight rate increase.

Statistics for Class 1 steam railroads, Interstate Commerce Commission.

These data indicate that the position of the railroads in the long-haul movement of molasses has declined. The recent lowering of freight rates for molasses moved by rail from New Orleans to Mississippi Valley points, where waterborne carrier competition for the long-haul operation has been keenest, cannot be fully evaluated as yet. The impact of this change in freight rates for rail movement to this area is discussed in the section on competition between the various carriers.

Feed-mill buyers of molasses made some suggestions as to the decline in use of railroads for delivery. One of the principal customer criticisms of railroad shipments of molasses concerned the inadequacy of delivery scheduling. An order might take as long as 3 weeks in being delivered or it might come in unannounced much earlier. With limited storage capacity available, the prompt unloading (before demurrage charges began) caused a hardship. One user suggested he would return to railroad delivery if self-contained units of about 1,000 gallons each were delivered by flat car under such arrangements that he could retain the units until their contents were used. The possibilities suggested are not without merit in the light of recent developments in bulk container deliveries of other commodities by railroad flat car.

MARKETING MOLASSES BY WATERBORNE CARRIER

Growth of the market for molasses in inland livestock areas and feed-mixing centers brought with it an increase in the use of waterborne carriers. Lower freight costs for large-volume long-distance hauls and location of many of the principal consuming points on navigable water were the primary incentives for the distributors of molasses to increase their use of waterborne carriers.

The consumer of molasses had little share in this advantage, however, other than convenience. The price of molasses at most river terminals and in the surrounding territory was the same as if the molasses moved by rail. Delivery was made by tank truck from a riverside terminal, however, and thus receipt could be had on short notice and in a bulk unit smaller and more suitable to small-volume buyers than a tank-car load.

The growth in waterborne movement of molasses to terminals at the river ports of the Mississippi River system is shown by the series of graphic illustrations in figure 3. In 1949 there were only 2 shipments reported, totaling 4,147 tons. They moved to Cincinnati from New Orleans. By 1954 the volume of traffic had expanded to 339,494 tons of upbound waterborne tonnage, and 2,845 tons of downbound tonnage, between the Mouth of Passes below New Orleans and all upriver points. In that year waterborne carriers on the Mississippi system alone moved almost 15 percent of the total molasses used for livestock feeding purposes. Coastwise movement and internal movement on other navigable river systems boosted the waterborne volume to 21.2 percent of the total.

Table 4 shows the total movement of molasses by waterborne carrier in the United States. Figure 4 shows the volume of blackstrap molasses movement at port terminals and price-basing points. A complete report of molasses movement by individual port and water routes is given in the appendix.

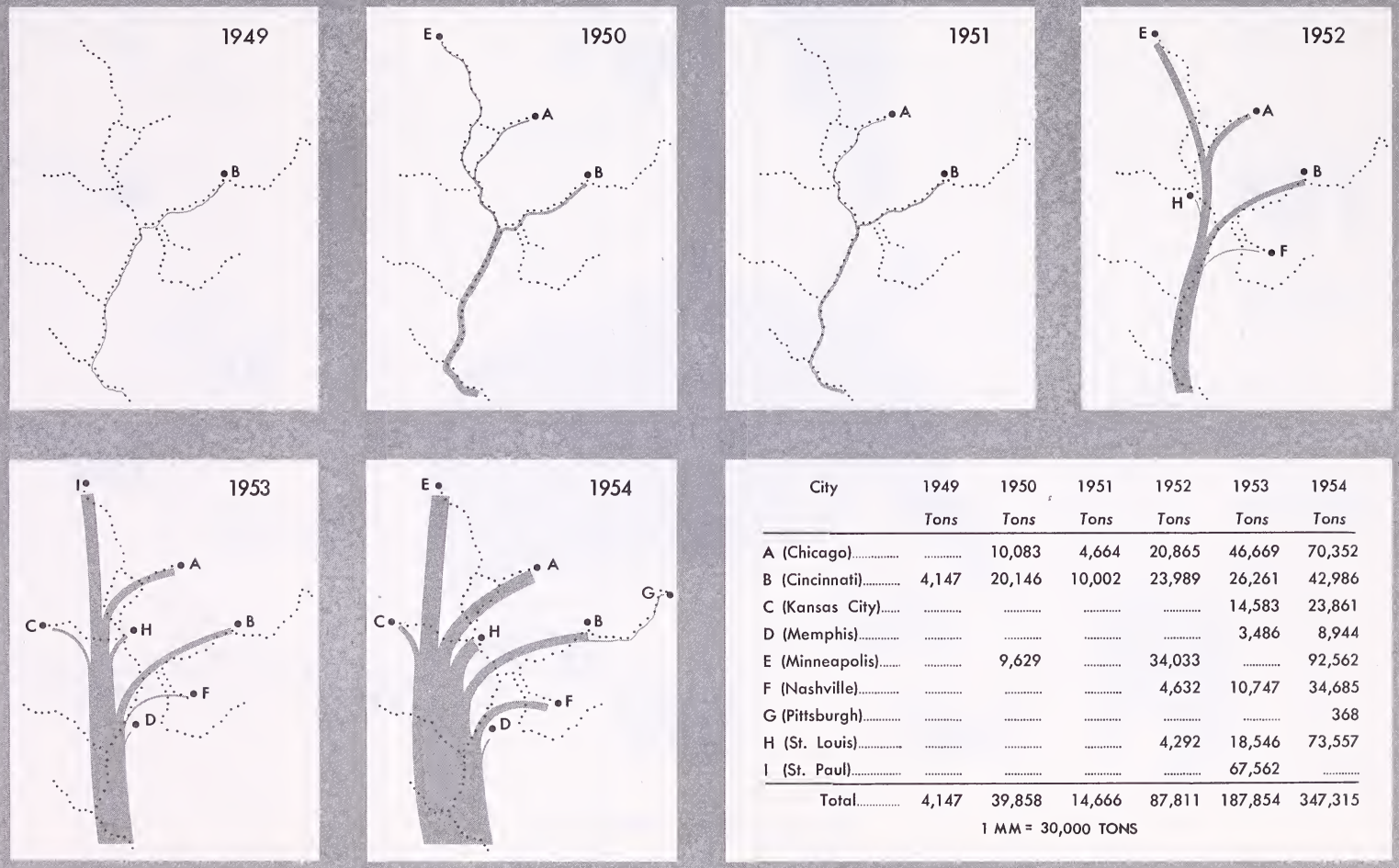
Table 4.--Waterborne movement of inedible molasses in the United States, 1949-54

Year	Total movement reported	Imports	Exports	Domestic receipts and shipments				
				Coastwise	Lakewise	Internal	Intra-territory	Intraport and local
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
1949.....	1,884,186	1,345,806	107,727	216,812	14,748	150,467	---	48,626
1950.....	2,099,359	1,514,329	186,088	191,074	14,871	137,605	24,472	30,920
1951.....	2,414,765	1,415,834	188,388	505,520	10,922	206,155	33,216	54,730
1952.....	2,839,282	1,952,765	53,886	493,526	5,655	278,920	41,020	13,510
1953.....	3,528,931	2,335,572	154,909	485,169	5,334	404,290	16,190	127,467
1954.....	3,514,223	2,160,583	174,479	437,796	5,645	638,996	32,599	64,125

Waterborne Commerce of the United States. Report of the Chief, U. S. Corps of Engineers, U. S. Army, for the years 1950 through 1955.

GROWTH OF MOLASSES SHIPMENTS

on Mississippi River System



City	1949	1950	1951	1952	1953	1954
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
A (Chicago)	.....	10,083	4,664	20,865	46,669	70,352
B (Cincinnati)	4,147	20,146	10,002	23,989	26,261	42,986
C (Kansas City)	.....	.....	.....	.....	14,583	23,861
D (Memphis)	.....	.....	.....	.....	3,486	8,944
E (Minneapolis)	.....	9,629	.....	34,033	.....	92,562
F (Nashville)	.....	.....	.....	4,632	10,747	34,685
G (Pittsburgh)	.....	.....	.....	.....	.....	368
H (St. Louis)	.....	.....	.....	4,292	18,546	73,557
I (St. Paul)	.....	.....	.....	.....	67,562	.....
Total	4,147	39,858	14,666	87,811	187,854	347,315

1 MM = 30,000 TONS

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Figure 3

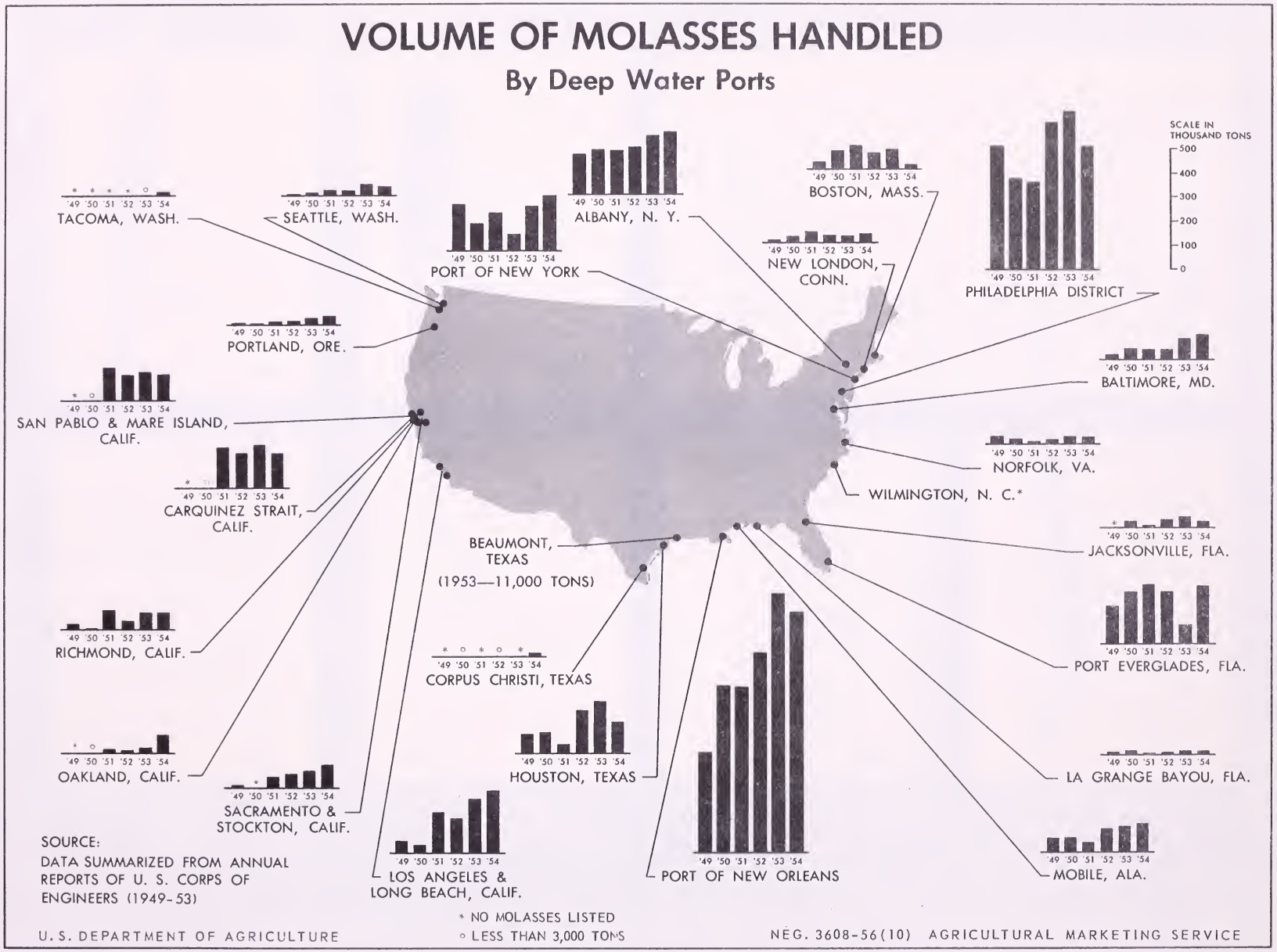
VOLUME OF MOLASSES HANDLED
By Deep Water Ports
SCALE IN THOUSAND TONS
500
400
300
200
100
0
'49 '50 '51 '52 '53 '54
TACOMA, WASH.
SEATTLE, WASH.
PORT OF NEW YORK
ALBANY, N. Y.
BOSTON, MASS.
NEW LONDON, CONN.
PHILADELPHIA DISTRICT
PORTLAND, ORE.
BALTIMORE, MD.
SAN PABLO & MARE ISLAND, CALIF.
NORFOLK, VA.
WILMINGTON, N. C.*
CARQUINEZ STRAIT, CALIF.
JACKSONVILLE, FLA.
BEAUMONT, TEXAS
(1953—11,000 TONS)
RICHMOND, CALIF.
PORT EVERGLADES, FLA.
CORPUS CHRISTI, TEXAS
OAKLAND, CALIF.
HOUSTON, TEXAS
LA GRANGE BAYOU, FLA.
SACRAMENTO & STOCKTON, CALIF.
LOS ANGELES & LONG BEACH, CALIF.
PORT OF NEW ORLEANS
MOBILE, ALA.
SOURCE:
DATA SUMMARIZED FROM ANNUAL REPORTS OF U. S. CORPS OF ENGINEERS (1949-53)
* NO MOLASSES LISTED
○ LESS THAN 3,000 TONS
U. S. DEPARTMENT OF AGRICULTURE
NEG. 3608-56(10) AGRICULTURAL MARKETING SERVICE

Figure 4

COMPETITION BETWEEN THE DIFFERENT CARRIERS

Each carrier, whether rail, waterborne, or motortruck, carries out the same general function of transporting molasses between the seaport terminal or mainland producer and the buyer. Variations in characteristic performance of this function are the points of competition between carriers.

The barge load is largest, and the usual equipment used for long distance movement is a tow of several barges and a river tug. This makes the volume of a single shipment as much as several hundred thousand gallons and suited only to an upriver redistribution terminal delivery. Buyers' orders for molasses are filled from the redistribution terminal.

Railroad tank cars built to carry molasses vary in volume from 8,000 to 12,000 gallons, and they are filled to 90 percent of capacity to get a carload freight rate; the minimum carload is 7,200 gallons. As indicated in footnote 5, feed mixers or livestock feeders have to be larger than average before they can economically assume the costs of storage facilities and molasses inventory that carload deliveries entail.

Tank trucks offer a much smaller bulk unit of delivery, ranging from the refill of a single drum or livestock feeder tank up to 3,500 gallons.

Whether molasses moves by rail or by water, the charges to consumers for transportation services are the same in most areas where both services are available. The published rates for railroads form the basis for charges by waterborne carriers. Within that rate the distributor using waterborne carrier must cover the cost of the barging, the terminal facility at the redistribution point, and the tank-truck operation between the river terminal and the users' receiving tank.

Table 5 gives a comparison between published railroad rates before and after the rate change effective January 26, 1956. It also gives the estimated range of barging costs, computed on a water mileage basis from New Orleans to a number of the upriver redistribution points on the Mississippi River system.

A buyer who bought molasses from a barge terminal operator at one of these points, Cincinnati, for example, would pay the New Orleans price for molasses plus the rail freight rate from New Orleans to Cincinnati. In this instance, he would pay the New Orleans price for molasses plus $9.20 per ton for freight. The $4.20 difference between the rail freight charge and the median estimate of barge cost would be available to pay for amortization and overhead costs at the terminal, tank-truck costs for delivery from the terminal to the user's storage tank, and profits for the molasses distributing firm.

The advantages of this system to the user are in the services rendered rather than in a lower price for molasses. A nearby supply of molasses gives the buyer the opportunity for prompt and closely scheduled deliveries and for dealing with a local business operator. Purchase can be in tank-truck lots, and the storage facility and inventory investment can thus be lower than the amount necessary if delivery were made by rail in tank-car lots.

Recently, changes were made in the railroad freight rate on molasses from New Orleans to many points served by railroads in the areas adjacent to upriver terminal cities and to feed-mixing centers (see, for example, rates in the second and third columns of table 5 for Kansas City, Omaha, and Minneapolis). These changes indicate the competitive nature of the molasses distributing business and the rivalry between firms for sales territories and each other's customers.

The net effect of this change in the railroad freight rate structure cannot be evaluated from presently available statistics. Table 5 indicates that with rail rates from New Orleans determining delivery charges for molasses at Minneapolis, Omaha, and

Table 5.--Railroad rates and estimated barge costs for moving molasses from New Orleans to important feed-mixing and molasses redistribution centers on the Mississippi River system[1]

City	Distance by water from New Orleans	Rail rate per ton		Estimated barge cost per ton[3]
		Before Jan. 26, 1956	Effective Jan. 26, 1956[2]	
	Miles	*Dollars*	*Dollars*	*Dollars*
Memphis.....	638	5.60	5.60	2.00-3.00
St. Louis.....	1,048	6.44	6.44	3.50-4.50
St. Louis.....	1,048	[4] 5.75	[4] 5.75	3.50-4.50
Peoria.....	1,248	---	9.00	4.00-5.00
Muscatine.....	[5] 1,350	---	9.00	4.25-5.25
Cincinnati.....	1,380	9.20	9.20	4.50-5.50
Chicago.....	1,408	8.00	8.00	4.50-5.50
Kansas City.....	1,441	12.65	9.00	[6] 5.00-6.00
Omaha.....	[5] 1,620	13.80	10.20	[6] 6.50-7.50
Dubuque.....	1,448	---	9.00	4.50-5.50
Minneapolis.....	1,722	17.25	12.80	5.50-6.50

[1] Rates do not include 3-percent transportation tax.
[2] Subject to 6 percent increase effective March 7, 1956.
[3] Estimated on basis of cost per mile for movement of loaded barge against flow of river. Blackstrap molasses is exempt from rate classification in barge load units.
[4] Rates on 1,800 ton lots.
[5] Estimated.
[6] Ton-mile costs to Kansas City and Omaha are combination rate estimates due to higher barging costs on Missouri River than on Mississippi River.

Kansas City, the operating margins for barge terminal operations at these points must have been reduced sharply. It is logical to assume that they would be reduced since a significant portion of the molasses used in each of these places is for feed mixing by large firms. Railroad deliveries would be readily acceptable to such firms since their rates of use, storage facilities, and access to rail facilities would be appropriate for rail deliveries from New Orleans if a saving were available.

Railroad and motortruck competition for servicing of large-volume consumers and tank-truck redistribution terminals is more difficult to ascertain from the mileage cost or rate viewpoint than for the railroads and waterborne carriers.

Tank-truck operators gave estimates of their round-trip mileage charges for delivery of molasses to customers and of their costs for operating tank trucks under typical load conditions. The median level of charges for delivery was 30 cents per round-trip mile for a 3,000-gallon delivery, equal to 1/10 of a mill per gallon. Costs for fuel, depreciation, and repairs on the truck plus wages of a driver averaged 23.6 cents per round-trip mile for a 3,000-gallon (17.5 ton) delivery.

Using a truck charge of 1/10 of a mill per round-trip mile per gallon against rail freight charges between specified points, we can estimate the competitive charges to consumers. Using the 23.6 cents mileage cost for tank trucks, we can compare a hypothetical tank-truck operator's costs with the cost of having a railroad perform the same service for him. As an example, filling the tank-truck operator's reserve storage tank or serving a large-volume buyer in San Antonio from the deep water terminal at Houston:

Highway mileage between the cities, plus 4 miles of turn around allowed at each end of run, gives 406 miles. The railroad tank-car freight rate from Houston to San Antonio is 31 cents per hundredweight.[6] A tank-truck delivery using average costs with a 17.5-ton load would cost $95.81 or 27.4 cents per hundredweight for this haul. If computed on the basis of the 1/10 of a mill per gallon per round-trip mile, the charge to a customer for tank-truck delivery would be 3,000 x 406 x .0001 or $121.80. Delivery by rail would cost approximately 3.6 cents per gallon. For tank-truck delivery the charge to the customer would be 4.06 cents per gallon.

In another example, from Los Angeles, Calif., to Phoenix, Ariz., using these same methods of imputed costs and charges for tank-truck delivery and published railroad rates, the railroad delivery charge would be 4.8 cents per gallon.[6] Tank-truck hauling cost would be 51.91 cents per hundredweight, and the charge to the customers would be 7.9 cents per gallon.

At points similar to San Antonio's position relative to Houston, a tank-truck operator uses his equipment for the long hauls to pick up molasses for delivery, frequently bypassing his own terminal to make delivery direct from the seaport terminal to his local customers. Such operators use rail delivery only in peak periods when their truck equipment is fully occupied in local service. In cases like Phoenix, rail delivery to the area could be expected to be utilized to the maximum, and tank trucks would only be used for the long haul when supplies were exhausted and the tank-truck operator was anxious to supply a customer's immediate needs.

The greatest flexibility of service is possible with tank-truck delivery to the consumer. A larger part of the potential market with bulk delivery can be reached if tank trucks operate at the consumer level of marketing. The tank-truck operator can serve the consumer who wants as little as a single drum refill, or he can serve the largest consumer by repeated hauls. He can readily handle pooled orders and part-load delivery on a route-system basis. In some areas visited, tank-truck operators served their customers by direct delivery to livestock feeder stations in the pasture or feeding pen. In another area, an operator had mounted a self-powered feed grinder on the molasses truck and ground the farmer's grains, hay, or roughage and mixed it with the molasses from his truck in a custom feed-grinding operation. These and similar developments in the molasses marketing system have made molasses available to a large and diverse group in the livestock feeding industry at prices competitive with other feeds.

At the beginning of this report, the results of a 1949 study were given comparing (1) costs of transporting and handling molasses, (2) producer return in Puerto Rico, and (3) price to a farmer in Wisconsin. Resurveying this ground on April 1, 1955, using the price at the Puerto Rican mill and a computed price for molasses put into a storage tank on a farm in Wisconsin, as indicated by average charges for tank-truck delivery, we find:

	Dollars per ton	Cents per gallon
Puerto Rican mill price, April 1, 1955...	11.97	7.0
Minneapolis terminal average price:		
April 1955	35.74	20.9
August 1955	35.70	20.8
September 1955	35.30	20.6

The molasses sold in April in Puerto Rico probably would not reach a market in Wisconsin until autumn. September would probably be the earliest month that the primary distributor could expect to sell his April purchase of Puerto Rican molasses in Wisconsin.

[6] This rate does not include the 3-percent transportation tax nor the 6-percent increase in rates effective March 7, 1956.

At a dairy farm near Eau Claire, Wis., 100 miles from Minneapolis, an "average" tank-truck operator would deliver this molasses at a price of $677.75 for 3,000 gallons, or 22.59 cents per gallon. The margin for transporting and handling equals 16 cents, a reduction of 8.2 cents, or 33 percent, of the 1949 margin. The producer's price advanced from 2.5 cents to 7 cents per gallon, and the price to the consumer was reduced from 26.7 cents to 22.59 cents per gallon during this period.

APPENDIX

The railroad movement statistics of inedible molasses by number of carloads and tonnage of originations and terminations within each railroad region and district for 1946 through 1954 are given in table 6. These statistics are designed for the use of railroads primarily, and therefore do not readily lend themselves to measurement of consumption within areas, nor of total volumes which were delivered to an area as a final destination. Movements are duplicated and may appear in both origination and termination columns for the same time period and region.

The statistics are useful for comparison with similar data from other modes of transport and for determination of transportation requirements for molasses at a given time or region.

These statistics are published quarterly by the Interstate Commerce Commission, Washington, D. C. Another series giving a 1-percent sample of individual bills of lading by States is also published. This series has the shortcoming of being too light a sample for a minor commodity like molasses.

The statistics in table 7 on waterborne movement of molasses are extracted from a series of reports issued by the U. S. Corps of Engineers. The statistics are gathered by the Corps of Engineers to gage the waterborne commerce at the various harbors and on the water routes for which this agency is responsible for surveillance, maintenance, or improvement.

Attempts to balance out or verify shipments through to destination on the basis of these statistics were not fully successful. Nevertheless, the value of the information to persons concerned with marketing molasses should not be overlooked. These figures serve to locate the supply of inedible molasses, principally blackstrap, at the various ocean ports for each year and give the type of waterborne movement by which this supply was received and shipped. The shift in direction of molasses movement to inland waterways in line with the growth of the market for molasses as a livestock feed is reflected by these statistics.

Description of waterborne freight movement has been reduced, for the sake of brevity, to 2 categories (Receipts and Shipments) and 4 types of movement under each category (Foreign, Coastwise, Lakewise, and Internal). The annual reports of the U. S. Corps of Engineers from which these data are taken contains much useful detail not carried here.

Table 6. --Railroad movement of molasses by number of carlots and by tonnage, 1946-54

Region and district	1946				1947				1948			
	Origination		Termination		Origination		Termination		Origination		Termination	
	Carload	Weight	Carload	Weight	Carload	Weight	Carload	Weight	Carload	Weight	Carload	Weight
Regions:	*Number*	*Tons*	*Number*	*Tons*	*Number*	*Tons*	*Number*	*Tons*	*Number*	*Tons*	*Number*	*Tons*
New England	154	6,020	525	22,504	444	17,504	684	28,011	387	15,585	928	40,219
Great Lakes	1,963	89,604	3,297	152,079	3,164	146,522	3,846	178,489	2,664	127,172	3,205	152,180
Central Eastern	1,039	47,001	2,342	110,238	1,909	83,387	2,682	123,556	2,612	121,201	3,328	160,194
Eastern district	3,156	142,625	6,164	284,821	5,517	247,413	7,212	330,056	5,663	263,958	7,461	352,593
Pocahontas	5	227	168	6,558	215	9,751	462	20,416	434	20,614	502	22,413
Southern	2,476	107,955	2,941	128,544	4,024	180,679	3,740	165,829	4,186	190,534	4,144	187,228
Southern district	2,481	108,182	3,109	135,102	4,239	190,430	4,202	186,245	4,620	211,148	4,646	209,641
Northwestern	1,455	70,149	1,649	75,871	1,771	84,358	2,061	95,345	1,798	85,338	2,341	110,513
Central Western	5,890	284,468	5,896	273,943	7,108	337,306	7,401	350,335	7,603	362,250	8,403	396,941
Southwestern	5,031	233,985	2,500	116,413	3,898	181,304	2,720	124,467	6,130	289,279	4,030	188,595
Western district	12,376	588,602	10,045	466,227	12,777	602,968	12,182	570,147	15,531	736,867	14,774	696,049
United States	18,013	839,409	19,318	886,150	22,533	1,040,811	23,596	1,086,448	25,814	1,211,973	26,881	1,258,283
	1949				1950				1951			
New England	374	15,749	895	38,987	402	17,943	742	33,515	293	13,515	569	26,420
Great Lakes	2,267	107,420	3,067	142,986	2,105	99,503	2,479	112,908	1,923	94,276	2,123	98,357
Central Eastern	2,524	118,150	3,049	145,222	1,645	76,238	2,546	120,287	1,286	62,281	2,365	114,976
Eastern district	5,165	241,319	7,011	327,195	4,152	193,684	5,767	266,710	3,502	170,072	5,057	239,753
Pocahontas	644	30,836	573	26,867	735	36,310	646	30,574	470	24,250	574	27,709
Southern	4,960	227,706	4,279	198,073	6,262	279,456	5,213	238,760	5,407	239,783	4,662	211,156
Southern district	5,604	258,542	4,852	224,940	6,997	315,766	5,859	269,334	5,877	264,033	5,236	238,865
Northwestern	1,622	78,097	2,521	118,784	1,623	76,086	2,823	129,310	1,935	89,941	2,771	127,759
Central Western	6,452	310,932	8,272	394,761	6,291	305,972	8,316	395,799	6,941	334,293	7,335	346,090
Southwestern	8,464	401,997	4,871	228,399	9,229	429,825	5,606	260,042	7,191	333,493	5,278	246,319
Western district	16,538	791,026	15,664	741,944	17,143	811,883	16,745	785,151	16,067	757,727	15,384	720,168
United States	27,307	1,290,887	27,527	1,294,079	28,292	1,321,333	28,371	1,321,195	25,446	1,191,832	25,677	1,198,786
	1952				1953				1954			
New England	393	17,928	697	31,515	374	17,392	715	33,567	256	11,811	659	31,355
Great Lakes	1,323	61,694	1,591	70,006	1,702	80,545	2,100	95,171	1,464	69,788	1,651	74,450
Central Eastern	1,538	65,454	2,234	103,893	1,949	88,659	2,525	120,702	1,653	78,192	2,210	108,604
Eastern district	3,254	145,076	4,522	205,414	4,025	186,596	5,340	249,440	3,373	159,791	4,520	214,409
Pocahontas	545	26,923	749	35,797	630	31,374	835	40,678	542	26,252	749	35,473
Southern	6,752	304,270	5,593	255,423	7,043	319,955	5,845	267,426	6,401	289,038	5,422	249,699
Southern District	7,297	331,193	6,342	291,220	7,673	351,329	6,680	308,104	6,943	315,290	6,171	285,172
Northwestern	1,750	83,421	2,898	131,088	2,291	107,083	3,398	153,581	1,963	91,502	2,769	124,975
Central Western	5,798	277,775	8,454	401,103	6,663	317,669	9,590	453,033	6,558	324,404	9,146	439,216
Southwestern	11,263	528,711	7,461	351,704	10,875	507,058	6,783	314,168	10,157	471,947	6,264	290,315
Western district	18,811	889,907	18,813	883,895	19,829	931,810	19,771	920,782	18,678	887,853	18,179	854,500
United States	29,362	1,366,176	29,677	1,380,529	31,527	1,469,735	31,791	1,478,326	28,994	1,362,934	28,870	1,354,087

Data from Statistics: Class 1 Steam Railroads in the United States, Interstate Commerce Commission.

Table 7. --Waterborne movements of inedible molasses in the United States, 1949-54[1]

Port or intermediate reporting point and year	Total reported	Receipts				Shipments				Supplemental data (See footnote 2 for abbreviations used)
		Foreign	Coastwise	Lakewise	Internal	Foreign	Coastwise	Lakewise	Internal	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	
New England District:										
Port of Boston:										
1949	29,370	11,357	13,670			5				2,887 lcl. shipment from main waterfront
1950	73,317	26,207	36,387							5,435 intrapt., 5,288 local
1951	92,643	64,237	14,538							5,741 intrapt., 8,127 local
1952	64,388	44,378	12,107			6				4,191 intrapt., 3,706 local
1953	79,955	61,289	10,508							463 local, 7,695 intrapt.
1954	20,495	20,495								20,495 main waterfront
Cape Cod Canal:										
1949	1,468								1,468	1,344 eastbound, 124 westbound
1950	5,172								5,172	532 eastbound, 4,640 westbound
1951	11,708					4,708	7,000			4,708 eastbound foreign, 7,000 eastbound domestic
1952	16,081					11,478	4,603			7,478 eastbd. for., 4,603 eastbd. dom., 4,000 for. westbd.
1953	8,756					8,326	430			8,326 for. eastbd., 430 dom. eastbd.
1954	1,200					1,200				1,200 for. eastbd.
New London:										
1949	10,716		10,716							
1950	27,562	10,400	9,962				2,400			4,800 local shipments and receipts
1951	44,063	10,490	15,823				7,000			10,750 local movement
1952	30,474	17,472	11,002							2,000 local movement
1953	25,686	7,742	10,920		7,024					
1954	35,932	21,055	4,013							10,864 local
New York District:										
Port of New York:										
1949	189,441	91,996	14,160		17,807		1,306		36,018	23,599 local shipments, 4,555 intrapt.
1950	114,338	39,337	17,240		17,717	83	1,565		22,999	5,815 intrapt. 9,582 local
1951	158,246	63,115	12,655		19,923	2,835	3,921		28,979	22,900 local, 3,918 intrapt.
1952	66,405	14,461	2,044		16,441	27	8,554		21,265	3,613 local
1953	184,681	76,182	2,468		9,413	2,806	4,309		37,883	35,089 local, 16,531 intrapt.
1954	229,644	122,193			6,700	43	38		52,605	37,056 local, 11,009 intrapt.
Hudson River:										
1949	187,861	67,049	68,100		5,468				46,244	1,000 local shipments
1950	236,725	134,400	40,400			10,928			50,997	
1951	188,931	122,792	56,842			9,297			93,392	20,923 downbd., 72,469 upbd.
1952	214,100	180,396	26,871			2	6,831		106,716	87,600 upbd., 19,116 downbd.
Harlem River to Waterford:										
1953	242,870	209,017	28,511			3,716	1,626		---	13,796 inbd., 65,752 outbd., 25,712 thrubd.
1954	242,435	222,018	8,575			11,842			---	110,891 upbd., 11,292 downbd.
Port of Albany:										
1949	168,075	54,633	68,100		4,348				40,994	
1950	184,849	104,241	26,110			10,928			43,570	
1951	182,941	67,004	58,782		5,803	9,262			42,090	
1952	196,138	107,816	22,499		2,688				63,135	
1953	244,804	162,840	28,511		4,819				48,634	
1954	256,943	172,916	8,575		10,806	11,842			52,804	
Federal Lock:										
Troy, N. Y.										
1949	25,696									25,696 Dom. inbd.
1950	100,647									100,647 Dom. inbd.
1951	110,085									110,085 Dom. inbd.
1952	105,886									105,886 Dom. inbd.
1953	n. a.									
1954	n. a.									
New York State Barge Canal:										
1949	120,515									28,167 Eastbd., 92,348 Westbd.
1950	104,664									22,073 Eastbd., 82,591 Westbd.
1951	108,650									33,300 Eastbd., 75,350 Westbd.
1952	104,413									20,050 Eastbd., 84,363 Westbd.
1953	96,652									13,012 Eastbd., 83,640 Westbd.
1954	136,135									17,125 Eastbd., 119,010 Westbd.

See footnotes at end of table.

Table 7. --Waterborne movements of inedible molasses in the United States, 1949-54[1]--Continued

Port or intermediate reporting point and year	Total reported	Receipts				Shipments				Supplemental data (See footnote 2 for abbreviations used)
		Foreign	Coastwise	Lakewise	Internal	Foreign	Coastwise	Lakewise	Internal	
Philadelphia District:										
Delaware River Philadelphia to Sea:	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	
1949	513,704	469,239	44,465							
1950	376,226	364,800	11,426							
1951	361,008	305,722	55,286							
1952	610,969	534,900	75,142			887	40			
1953	654,443	592,681	16,163				8,772			36,827 local movement downbd. dom.
1954	511,892	494,297	5,995				11,600			
Philadelphia Harbor:										
1949	442,850	398,385	44,465							
1950	254,267	242,841	11,426							
1951	190,442	164,811	25,631							
1952	464,623	432,838	30,858			887	40			
1953	577,960	516,198	16,163				8,772			36,827 local movement
1954	511,892	494,297	5,995				11,600			
Inland Waterway Delaware River to Chesapeake Bay:										
1949										
1950	1,678						1,678			1,678 Westbd. Cstwise
1951	8,434								8,434	8,434 Eastbd.
1952	6,693								6,693	6,693 Eastbd.
1953	12,710						97		12,613	12,613 Eastbd., 97 Westbd. for.
1954	53									3 Dom. Cstwise Eastbd., 50 Westbd.
Wilmington, Delaware:										
1949	47,825	47,825								
		No molasses - 1950-54								
Baltimore District:										
Baltimore Harbor:										
1949	20,976	20,933					43			
1950	43,104	21,877	21,216			11				
1951	41,438	24,613	16,825							
1952	41,411	38,810	2,601							
1953	85,467	67,519	17,948							
1954	105,830	95,011	10,819							
Norfolk District:										
Norfolk Harbor:										
1949	30,722	30,722								
1950	19,505	19,505								
1951	10,450	10,450								
1952	16,112	11,209	4,903							
1953	29,077	23,829	5,248							
1954	25,718	18,326	7,392							
Wilmington, N. C., District:										
Wilmington:		No molasses reported 1949-53								
1954	20,378	13,329	7,049							
Savannah, Ga., District:										
Savannah:		No molasses reported 1949-53								
1954	3,552				3,552					3,552 thru Northbd.
Jacksonville, Fla., District:										
Jacksonville Harbor:										
1949										
1950	26,540	14,948	11,952							
1951	10,425		10,425							
1952	32,849		32,835			14				
1953	44,043	44,043								
1954	28,292		24,740							3,552 thru Northbd.

See footnotes at end of table.

Table 7.--Waterborne movements of inedible molasses in the United States, 1949-54[1]--Continued

Port or intermediate reporting point and year	Total reported	Receipts				Shipments				Supplemental data (See footnote 2 for abbreviations used)
		Foreign	Coastwise	Lakewise	Internal	Foreign	Coastwise	Lakewise	Internal	
Jacksonville, Fla., District--Continued										
Port Everglades:	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	
1949	150,833	84,351				66,482				
1950	217,177	90,841				126.336				
1951	245,395	78,464				166,931				
1952	216,632	147,215				25,133	44,284			
1953	74,991	7,532				67,459				
1954	240,027	126,051				113,976				
Mobile, Ala., District:										
LaGrange, Fla., Bayou and Gulf intercoastal Waterway:										
1949	9,388						9,388			9,388 inbd.
1950	14,694									14,694 inbd.
1951	2,862						2,862			2,862 inbd. from Mobile
1952	9,259									9,259 Eastbd. to Choctawhatchee Bay from Mobile Bay
1953	12,679									12,679 Eastbd. to Choctawhatchee Bay from Mobile Bay
1954	12,207									12,207 Eastbd. to Choctawhatchee Bay from Mobile Bay
Mobile Harbor:										
1949	57,576	47,310							10,266	
1950	58,514	35,181	11,351						11,982	
1951	39,039	38,093							946	
1952	96,756	90,162							6,594	
1953	108,628	68,012	29,724						10,892	
1954	117,752	74,510	10,939						32,303	
New Orleans, La., District:										
Port of New Orleans:										
1949	416,611	373,761				4,689	34,014		4,147	See Mississippi River District
1950	687,810	616,392	26,027			3,876	178		41,337	See Mississippi River District
1951	680,943	579,135	83,080		1,892		2,311		11,928	See Mississippi River District
1952	827,262	639,555	94,790		2,107	256	78		90,476	See Mississippi River District
1953	1,067,034	799,362	68,356				44		175,433	See Mississippi River District
1954	993,834	600,394	65,393						322,851	5,196 local
Galveston, Tex., District:										
Houston Ship Channel:										
1949	79,316	79,273	43							
1950	82,876	73,950	8,926							
1951	37,596	37,596								
1952	176,939	148,176	28,763							
1953	216,171	183,728	27,229						5,214	5,214 Southbd-Eastbd via Lake Charles to deep water
1954	130,617	105,473	25,144							
Corpus Christi, Tex.:										
1949	---									
1950	1,678						1,678			
1951	---									
1952	200	200								
1953		Not available								
1954	12,880	11,503							1,377	
Sabine-Neches Waterway, Texas:		No molasses reported 1949-52								
1953	16,124	11,000							5,214	5,214 thru to Lake Charles
1954	13,042	11,665							1,377	1,377 thru traffic Galveston to Mississippi
Los Angeles District:										
Long Beach Harbor:										
1949	---									
1950	---									
1951	1,384	1,344	40							
1952	3,890	3,890								
1953	4,448	4,448								
1954	14,525	14,525								

See footnotes at end of table.

Table 7.--Waterborne movements of inedible molasses in the United States, 1949-54[1]--Continued

Port or intermediate reporting point and year	Total reported	Receipts				Shipments				Supplemental data (See footnote 2 for abbreviations used)
		Foreign	Coastwise	Lakewise	Internal	Foreign	Coastwise	Lakewise	Internal	
Los Angeles District--Continued										
Los Angeles Harbor:	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	
1949	45,140	11,538	33,602							
1950	34,270	34,071	199							
1951	168,687	61,717	106,970							
1952	137,945	63,656	74,289							
1953	221,847	145,840	76,007							
1954	244,512	144,823	95,756				3,933			
San Francisco District:										
Carquinez Strait:										
1949	---									
1950	1,500					1,500				
1951	167,825		77,076							11,610 thrubd
1952	147,271		61,671						69,411	16,189 thrubd
1953	178,556		73,062						95,029	10,465 thrubd
1954	145,257		23,919						70,734	50,604 thrubd
San Pablo Bay and Mare Island Strait:	---									
1949	---									
1950	1,500								1,500	1,500 thrubd to for. export
1951	137,574								137,574	137,574 thrubd
1952	105,113								105,113	105,113 thrubd
1953	119,280									119,280 thrubd
1954	105,558									105,558 thrubd
Richmond Harbor:										
1949	20,524		20,524							
1950	3,706						3,706			
1951	78,082	19,916	9,278		48,888					
1952	37,651		6,902		30,749					
1953	70,232	18,618	15,861		35,753					
1954	69,300	15,406	13,231		33,963		6,700			
Oakland Harbor:										
1949	---									
1950	58		58							
1951	18,342		9,132						9,210	
1952	13,098		11,697						1,401	
1953	21,891		21,891							
1954	70,907		59,603						11,304	
San Francisco Harbor:										
1949	---									
1950	223		223							
1951	1,125		1,095			30				
1952	6,561		2,221						4,340	
1953	6,123	2,086	4,037							
1954	4,750								4,750	
Sacramento, Calif., District:										
San Joaquin River Including Stockton:										
1949	13,727		13,727							
1950	---									
1951	41,861				41,861					41,861 to Port of Stockton
1952	58,347		13,944		44,403					
1953	69,741		10,465		59,276					69,741 thru Suisun Bay Channel, Calif.
1954	93,633	32,968	3,920		52,825					3,920 thru Suisun Bay Channel, Calif.
Portland, Oreg., District:										
Columbia River and lower Willamette River (Same as Portland Harbor):										
1949	5,669						5,669			5,669 thrubd cstwise to Seattle
1950	3,079		3,047				32			32 to Seward, Alaska
1951	11,655		11,655							
1952	15,216		15,216							
1953	27,304		27,304							27,304 thru to International Boundary
1954	32,577		32,577							

See footnotes at end of table.

Table 7. --Waterborne movements of inedible molasses in the United States, 1949-54[1]--Continued

Port or intermediate reporting point and year	Total reported	Receipts				Shipments				Supplemental data (See footnote 2 for abbreviations used)
		Foreign	Coastwise	Lakewise	Internal	Foreign	Coastwise	Lakewise	Internal	
Seattle, Wash., District:										
Seattle Harbor:	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	
1949	5,669		5,669							
1950	11,913	255	7,999				3,659			
1951	22,662		22,662							
1952	21,137		16,550				4,587			
1953	42,896	5,507	37,389							
1954	37,297	16,541	20,756							
Tacoma Harbor:		No molasses reported 1949-52								
1953	1,078		1,078							
1954	17,975	17,975								
Mississippi River District:										
Minneapolis to Mouth of Passes:										
1949	422,916	384,213				4,689	34,014			4,147 dom. with 1,429 outbd-upbd, 2,718 thru upbd
1950	678,638	648,557	26,027			3,876	178			41,337 dom. with 38,625 upbd & 2,712 downbd-outbd
1951	674,395	589,004	83,080				2,311			17,273 upbd, 3,808 downbd
1952	757,014	661,890	94,790			256	78			87,811 upbd, 4,772 downbd dom. int.
1953	879,474	811,073	68,356			1	44			4,318 downbd, 215,379 upbd
1954	665,787	600,394	65,393							9,296 downbd, 390,774 upbd
New Orleans to Mouth of Passes:										
1949	404,477	373,761				4,689				4,147 upbd
1950	703,348	616,392	26,027			3,876	178			38,625 upbd, 2,712 downbd
1951	684,782	579,135	83,080				2,311			12,609 upbd, 3,808 downbd
1952	734,679	639,555	94,790			256	78			87,871 upbd, 2,665 downbd dom., 2,107 downbd for.
1953	891,601	799,362	68,356			1	44			Local 23,838, 215,379 upbd, 4,318 downbd
1954	666,383	600,394	65,393							Local 596,339, 494 upbd, 2,845 downbd
Baton Rouge to New Orleans: Include for. movement to Port of Baton Rouge:										
1949	14,599	10,452							4,147	4,147 upbd
1950	70,790	32,165							38,625	38,625 to upriver points (thrubd)
1951	24,545	9,869							14,676	4,664 to Chicago, 10,012 to Cincinnati (thrubd)
1952	112,253	22,335							89,918	2,107 to New Orleans, 87,811 upriver points (thrubd)
1953	159,071	11,711							147,360	147,360 upbd
1954	334,666	---							334,666	334,666 upbd
Mouth of Ohio River to Baton Rouge:										
1949	4,147								4,147	4,147 to Ohio River
1950	38,625								38,625	20,146 to Cincinnati, 18,479 to upriver ports
1951	14,676								14,676	10,012 to Cincinnati, 4,664 to Chicago
1952	89,918								89,918	87,811 thru upbd, 2,107 thru downbd
1953	147,360								147,360	147,360 upbd
1954	334,666								334,666	334,666 upbd
Mouth of Missouri to Mouth of Ohio:										
1949	---									
1950	18,479				18,479				18,479	10,083 to Chicago, 8,396 to Minneapolis
1951	4,664								4,664	4,664 to Chicago
1952	61,297				4,292				57,005	54,898 upbd, 2,107 downbd
1953	147,360									147,360 upbd
1954	304,918									298,467 upbd, 6,451 downbd
Minneapolis to mouth of Missouri:										
1949	---									
1950	9,629				8,396				1,233	1,233 thru downbd
1951	4,664								4,664	Thru upbd to Chicago
1952	57,005				34,033				22,972	20,865 to Chicago, 2,107 from Illinois River to New Orleans
1953	114,231									114,231 upbd
1954	162,914								162,914	162,914 upbd

See footnotes at end of table.

Table 7. --Waterborne movements of inedible molasses in the United States, 1949-54[1]--Continued

Port or intermediate reporting point and year	Total reported	Receipts				Shipments				Supplemental data (See footnote 2 for abbreviations used)
		Foreign	Coastwise	Lakewise	Internal	Foreign	Coastwise	Lakewise	Internal	
Internal River Ports of the Mississippi River System:										
Cincinnati:	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	
1949	4,147									
1950	20,146									
1951	10,012									
1952	23,989									
1953	26,261									
1954	42,986									
Nashville:										
1949	---									
1950	---									
1951	---									
1952	4,632				4,632					
1953	10,747				10,747					
1954	34,685									
St. Louis:										
1949	---									
1950	---									
1951	---									
1952	4,292				4,292					
1953	18,546				18,546					
1954	130,920				73,557				57,363	
Pittsburgh:										
1954	368				368					
Memphis:										
1954	8,944									
Missouri River to Kansas City:										
1951	---									
1952	---									
1953	14,583				14,583					
1954	23,861				23,861					
Ohio River from Pittsburgh to mouth:										
1949	4,147				4,147					
1950	20,146				20,146					
1951	10,012				10,012					
1952	23,989									
1953	26,261									
1954	43,354									
Great Lakes Ports:										
Duluth-Superior:										
1949	14,748							14,748		
1950	14,871							14,871		
1951	10,922							10,922		
1952	5,665							5,655		
1953	5,334							5,334		
1954	5,645							5,645		
Chicago Harbor:										
1949	---									
1950	10,083									
1951	4,664									
1952	20,865									
1953	46,669									
1954	70,352				70,352					7,989 thrubd
Chicago & Illinois Waterway:										
1949	---									
1950	10,083									6,342 to Chicago via Sanitary & Ship Canal, 3,741 thrubd to Lake
1951	4,664									
1952	22,972				20,002			863	2,107	2,107 downbd to New Orleans, 863 thru to Lakes
1953	48,669				43,869			4,800		4,800 thrubd to Lakes
1954	89,428									89,428 upbd

See footnotes at end of table

Table 7. --Waterborne movements of inedible molasses in the United States, 1949-54[1]--Continued

Port or intermediate reporting point and year	Total reported	Receipts				Shipments				Supplemental data (See footnote 2 for abbreviations used)
		Foreign	Coastwise	Lakewise	Internal	Foreign	Coastwise	Lakewise	Internal	
Great Lakes Ports--Continued										
Port of Buffalo:	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	
1949	114,340			14,748	70,150		8,200		21,242	See footnote 3
1950	105,122			14,871	67,493	600	4,441		17,717	See footnote 4
1951	104,203		12,223	10,922	60,035		10,922		20,923	See footnote 5
1952	188,205		3,225	5,655	78,032		5,655	36,496	16,991	See footnote 6
1953	141,344			5,334	73,870				12,767	See footnote 7
1954	185,503			5,645	93,099		4,013		13,029	See footnote 8

[1] Data from Waterborne Commerce of the United States. Report of the Chief, U. S. Corps of Engineers, for the years 1950 through 1955.
[2] Abbreviations used: Lcl - local; intrapt - intraport; Eastbd - Eastbound; Westbd - Westbound; Northbd - Northbound; Southbd - Southbound; thrubd - throughbound; inbd - inbound; outbd - outbound; upbd - upbound; downbd - downbound; dom. - domestic; for. - foreign; cstwise - coastwise; thru - through; int. - internal.
[3] (Plus 2,800 intrapt movement) 14,748 thru Northbd and 33,451 thru Southbd via Black Rock Lock.
[4] 600 to Canada, 40,744 Southbd and 14,871 thru Northbd via Black Rock Lock.
[5] 10,922 thrubd Duluth to Coastwise, 19,944 thrubd South (transit of necessity).
[6] 36,496 thrubd Southbd, 5,655 thrubd Northbd.
[7] 15,384 Northbd thrubd, 33,989 Southbd thrubd Black Rock Lock.
[8] 14,710 Northbd thrubd, 55,007 Southbd thrubd Black Rock Lock.

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